

**FREQUENTLY ASKED QUESTIONS
ABOUT KANSAS SCIENCE STANDARDS**
(Revised by the Kansas State Board on November 8, 2005)

Q: How have the Standards improved?

A: The New Standards:

- reflect updated science
- promote decision making that is both *informed* and reasoned.
- have improved guidance for teachers (i.e., teacher’s notes).
- contain more specific teaching objectives formatted to facilitate assessment.
- are better organized (columnar format and grade split at 8 instead of 9th).
- include guidance for objectively teaching the scientific controversy over evolution.
- delete advice that would deflect student questions about origins. [Introduction].
- include guidance that teachers should reinforce normative parental and legal expectations about health issues rather than leading children to make their own decisions in disregard of those expectations.

Q: How does the 2005 definition of science differ from the 2001 definition?

A: 2001 Definition: “Science is the human activity of seeking natural explanations of the world around us.”

2005 Definition: “*Science is a systematic method of continuing investigation, that uses observation, hypothesis testing, measurement, experimentation, logical argument and theory building, to lead to more adequate explanations of natural phenomena.*” [The definition continues for two more paragraphs that increase, rather than decrease the scientific rigor of this concept.]

Q: Does the 2005 definition redefine science?

A: No. The 2001 definition redefined science. That definition is found in no other state standards. Nor was it found in standard dictionaries or in a number of K-12 biology textbooks. Testimony at the hearings showed that it was not consistent with traditional definitions of science. The 2005 definition (together with its context) is a traditional definition that rectifies these problems and, in addition:

- Is rigorously objective and focused on empiricism.
- Derives from the Ohio Academy of Science definition.
- Is consistent with the definition embraced by the Supreme Court.

Q: Doesn’t the deletion of the word “natural” from the definition imply that Kansas will now seek supernatural causes?

A: No. By describing science as an open-ended search for more adequate or reliable explanations using empirical methods, it implies nothing about the supernatural. This also makes the definition *areligious* – religiously neutral, a feature important to both science and public education.

Q: I keep hearing the Board inserted Intelligent Design into the standards. Is this true?

A: No. It expressly excluded ID from the standards.

Q: Did the Board remove evolution from the standards as stated by the Executive Director of the National Association of Biology Teachers?

A: No. This is misinformation that seeks to demean those who suggest that it be discussed comprehensively.

Q: Why has the Board opened Pandora’s box by inserting discussions of origins into the standards?

A: The Board did not open the box. It was opened by current biology textbooks and prior science standards that deal with the origin of the universe, the origin of life and the origin of the diversity of life. The 2005 standards simply introduce some objectivity into the discussion.

Q: What specific changes did the Board make about origins and evolution?

A: The Board made the following changes:

- The Board added a qualifying sentence to an introductory paragraph that suggests a self-existing universe: ***“Although science proposes theories to explain changes, the actual causes of many changes are currently unknown (e.g. the origin of the universe, the origin of fundamental laws, the origin of life and the genetic code, and the origin of major body plans during the Cambrian explosion).”***
- The Board added an indicator under the benchmark dealing with the testing of scientific theories, that discusses how to evaluate historical claims about the cause of singular, unobserved events that occurred many years ago, that can not be replicated in the lab and that are not amenable to experimental confirmation. This is important not only to origins, but also to geology, paleontology, archeology, and forensic sciences that deal with crime scene investigations. **(G8-12,S1,B1,I 6)**
- The Board added material that more completely describes the core postulates of evolutionary theory and relevant information regarding its mechanisms:
 - ***“Biological evolution postulates an unguided natural process that has no discernable direction or goal.”*** (G8-12,S3,B3,I1)
 - ***“The sequence of the nucleotide bases within genes is not dictated by any known chemical or physical law.”***(G8-12,S3,B2,I1)
 - ***“New heritable traits may result from new combinations of genes and from random mutations or changes in the reproductive cells. Except in very rare cases, mutations that may be inherited are neutral, deleterious or fatal.”*** (G8-12,S3,B3,I2)
- The Board introduced students to the following scientific controversies about evolutionary theory:
 - The controversy surrounding the theory of universal common ancestry. It is commonly described with the metaphor of a ***“a branching tree.”*** The 2005 Standards will introduce students to evidence that supports the theory as well as to evidence inconsistent with the theory, such as **(a) “discrepancies in the molecular evidence;” (b) a fossil record that “shows sudden bursts of increased complexity (the Cambrian Explosion), long periods of stasis and the absence of abundant transitional forms rather than steady gradual increases in complexity”; and (c) studies “that show animals follow different rather than identical early stages of embryological development.”** [G8-12,S3,B3,I1(f)]
 - Scientific challenges to the argument that the evolutionary mechanisms that are known to produce micro changes within a species can adequately explain macro changes such as ***“new complex organs or body plans and new biochemical systems which appear irreducibly complex.”*** [G8-12,S3,B3,I3]
 - Scientific challenges to naturalistic explanations for the origin of life - [G8-12,S3,B3,I7]

Q: What is the scientific basis for the changes?

A: Most of the changes reflect common sense and all have a solid scientific basis. They were crafted by eight members of the Writing Committee, three of which hold doctoral degrees in the life sciences (biochemistry, entomology and medicine). They were then scientifically and educationally validated by 23 experts during 3 days of hearings in May, 2005 by 5 PhD biologists/molecular biologists, 4 PhD biochemists, 3 PhD Chemists (2 with expertise in theories of chemical evolution - origin of life), 1 PhD Geneticist (the inventor of the Gene Gun), 1 PhD Quantum Physicist, 3 Philosophers of Science (two with PhD's), 1 PhD Professor of Education, 3 biology teachers, a Muslim journalist and an attorney.

Q: Some have challenged the statement that evolution “postulates an unguided natural process that has no discernable direction or goal.” They argue that science is neutral as to whether the process is guided or unguided. How do you respond?

A: The claim is driven by politics rather than science since the lack of guidance in evolution is consistent with the views of only a small minority of the population. A recent letter from 38 Nobel Laureates to Kansas State Board of Education confirms the validity of the description. The letter states: “Logically derived from confirmable evidence, evolution is understood to be the result of an **unguided, unplanned** process of **random mutation** and natural selection.”

Q: Are the changes educationally appropriate? It has been argued that many biology teachers will disregard them.

A: Yes. They seek objective discussions of origins that are less stressful for students and teachers.

Teachers testified at the hearings that they are afraid to teach origins objectively because of pressure from institutions of science and education. Professor Nord argued that a *liberal* education requires teaching both sides of controversial issues. Testimony also indicated this was legally necessary.

Q: Why is the teaching of origins so controversial?

A: It is scientifically controversial because it is historical and therefore very subjective. It is religiously controversial because it addresses the question: “*where do we come from?*”

Q: Why do we get conflicting reports about the changes to the standards?

A: The organizations that oppose the changes are unwilling to publicly debate evolution because they falsely claim it is not scientifically controversial. To avoid a discussion of the real controversy they unfairly demean those who seek it. This strategy is explained by the media and public relations officer of the Kansas Citizens for Science, the organization that is leading the opposition. The boycott of the May hearings is an example of an implementation of the strategy.

Q: Where can I find the “strategy” you speak about?

A: Go to www.kansascience2005.com). The February 10, 2005 post by the Media and Public Officer of Kansas Citizens for Science states:

“My strategy at this point is the same as it was in 1999: notify the national and local media about what's going on and *portray them in the harshest light possible*, as political opportunists, evangelical activists, ignoramuses, breakers of rules, unprincipled bullies, etc. There may [be] (sic) no way to head off another science standards debacle, but *we can sure make them look like asses as they do what they do. Our target is the moderates who are not that well educated about the issues*, most of whom probably are theistic evolutionists. There is no way to convert the creationists.”

- Q: Is it true that the changes seek to criticize evolution to advance religion?**
- A: No. They seek to eliminate rather than advance a religious bias that permeated the old standards.** The Board changes are designed to encourage an objective rather than a biased teaching of scientifically controversial topics that have unavoidable religious implications.
- Q: Are the changes legal? It has been argued that they insert religion into the standards.**
- A: Yes, they are legal.** They insert scientific objectivity rather than a bias that favors a particular religious perspective. In fact, the changes may be legally necessary to encourage public school discussions of origins that are “secular, neutral and non-ideological.”
- Q: Doesn't the law prevent criticism of evolution? The Court in the Dover case suggested this.**
- A: Of course not.** If evolutionary theory could not be criticized, then it would become an ideology and not a scientific theory. A core principle of science is skepticism.
- Q: Isn't the Board taking Kansas back to the Dark Ages by teaching students scientific criticisms of evolution?**
- A: On the contrary, those who would suppress scientific challenges to evolution are the regressives.**
- Q: We hear that the changes will drive science businesses out of Kansas and our students won't be able to get into college.**
- A: This is pure propaganda designed to frighten rather than inform.** It amounts to crying “FIRE! FIRE!” in a crowded theater when there is no fire. This deception was concocted by founders of Kansas Citizens for Science and was outlined in the November 2000 issue of *Freethought Today*, a publication of atheists and agnostics.
- Q: Why not teach intelligent design (ID) in a religion class?**
- A: First, religion is not taught in K-12 public schools. Second, this is a “strawman” argument designed to take your eye off of evolution.** The Standards do not require the teaching of ID; they specifically exclude it. In addition, it is not logically possible to bifurcate a discussion of evolution's claim that life is not designed from the scientific disagreement with that claim. Also, religion instructors are completely unqualified to teach the scientific aspects which form the basis of the controversy.
- Q: Isn't there a course now at KU that proposes to teach ID in a religious studies course about myths?**
- A: Such a course was proposed, but was cancelled when it became clear that it was a sham devised by an atheistic religion professor who proposed it to denigrate both the idea and those who embrace it.**
- Q: Are there other significant changes in the Standards?**
- A: Yes.** A middle school standard was revised to encourage teachers to reinforce normative parental and legal expectations about health behaviors rather than to disregard them. Also, the Board eliminated controversial references in the 2001 Standards to humans as “soft machines,” and other provisions which suggest that human behaviors, like those of animals, have just “evolved” through natural selection.
- Q: How do parents want origins taught?**
- A: Most Polls conducted by a number of highly regarded organizations show that more than 80% of the public oppose an “evolution only” curriculum, i.e., one that discourages criticisms of evolution.**